Wadi D. Haddad, ***Editor***

If Technology Is the Solution Where Is the Problem?

Thomas Edison, in 1922, predicted that "the motion picture is destined to revolutionize our educational system and ... in a few years it will supplant largely, if not entirely, the use of textbooks." Similar claims have been made about radio, teaching machines, and now computers and the Internet. If technologies have the potential to significantly improve the teaching/learning process and revolutionize the education enterprise, in the same manner that they revolutionized business and entertainment, how come we have not experienced such drastic effects**? If technologies are the solution they claim to be, then where is the problem?** Experience points to five areas:

1. Is the educational philosophy right?

Technology is only a tool. Educational choices have to be made first in terms of objectives, methodologies, and roles of teachers and students before decisions on the appropriate technologies can be made. No technology can fix bad educational philosophy and practice. The challenge is to rethink learning objectives and to align the learning technologies with these objectives. Education quality must be redefined and framed to include critical thinking, information management and sense-making capacities. It is no longer enough merely to be efficient in helping learners achieve mastery of content and basic skills. The need is for a different education, with success measured more by the ability of learners to think independently, exercise appropriate judgment and skepticism, and collaborate with others to make sense of their changing environment. Perhaps the most profound shift is from systems of teaching to systems of learning and from supervision of learning to facilitation of learning. These shifts will be as difficult for advantaged communities to make, with established schooling authorities and capacities in place, as for disadvantaged communities which have yet to establish the physical capacities and for which questions of appropriate knowledge and relevant skills are still open.

There is a basic difference between using technology as an add-on to make the present model of education more efficient, more equitable and cheaper, on the one hand, and integrating technology into the entire education system to realize structural rethinking and re-engineering on the other. It is a difference between a marginal addition and a radical systemic change. It is in the second scenario that technology can provide the greatest impact. This opportunity was clearly articulated by Louis V. Gerstner, Jr., Chairman and CEO of IBM, in a 1995 speech to the U.S. National Governors' Association:

> *Information technology is the fundamental underpinning of the science of structural re-engineering. It is the force that revolutionizes business, streamlines government, and enables instant communications and the exchange of information among people and institutions around the world. But information technology has not made even its barest appearance in most public schools.… Before we can get the education revolution rolling, we need to recognize that our public schools are low-tech institutions in a high-tech society. The same changes that have brought cataclysmic change to every face of business can improve the way we teach students and teachers. And it can also improve the efficiency and effectiveness of how we run our schools.*

2. Are the people involved well oriented and trained?

People involved in the integration of technologies into the teaching /learning process have to be convinced of the value of the technologies, comfortable with them and skilled in using them. So a program of orientation and training of ALL CONCERNED STAFF in the strategic, technical and pedagogical dimensions of the process is a necessary condition for success.

3. Is the hardware in place?

A choice of the appropriate technologies needs to be made on the basis of educational objectives and affordability. Then the entire hardware infrastructure needs to be in place with the supporting elements, such as electricity, maintenance and technical services. It is not realistic to expect teachers, who will be struggling with a new role and pedagogy, to assume technical responsibility for the hardware.

4. Is appropriate content-ware available?

This is one of the most forgotten areas. Yet when you think about it, it is the most crucial component. Introducing TVs, radios, computers and connectivity into schools without sufficient curriculum-related content-ware is like building roads but without making cars available, or buying a CD-player at

home when there are no CDs. The development of content software that is an integral part of the teaching/learning process is a must.

5. Has the program been tested?

Integrating technologies into education is a very sophisticated multifaceted process, and just like any innovation it should not be introduced without piloting its different components on a small scale. Even the technologies, about which we are sure, need to be piloted in new contexts. Moreover, pilot schemes should be well designed to provide prognostic feedback, allowance for adjustment and scaling up.

Technologies have great potential for knowledge dissemination, effective learning and efficient education services. Yet, if the educational strategies are not right and if the prerequisite conditions are not met concurrently, this potential will not be realized. Let us not automatically doubt the solution. Let us get rid of the problems.

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An Update…

The launching of TechKnowLogia on September 1, 1999, was received with great acceptance that surpassed our expectations. This validated our view that such a journal is a necessity in this field that is evolving exceedingly fast. We are pleased to report that the journal is now read by about 10,000 in over 100 countries in all regions of the world. Our subscribers are a highly influential group of people: decision-makers at policy and program levels, CEOs of Information and Communication Technology firms, senior academics, officers of development agencies and practitioners in education and technology. We are also featured on a number of prominent web sites - and the circle is ever widening.

I am deeply appreciative of the concerted efforts of our collaborators, members of our International Advisory Board and the Advisory Editorial Committee, our contributing editors, and staff that have been very crucial in the preparation and launching of the introductory issue. We will continue to look to them for support, advice, and contribution.

I am equally appreciative of the enthusiasm by which our readers have responded to the Journal. I am particularly grateful to those of you who took the time to send us your comments and feedback (especially that the vast majority was exceedingly positive!). As you will notice in this issue, we took your suggestions very seriously and have tried to incorporate them immediately. We hope that you will continue your support and that you will call the attention of your colleagues to the benefits of ***TechKnowLogia***.

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